ASRTU SPECIFICATION FOR TYRE CURING BLADDER
(for pre-cured retreading process)

0.0 SPECIFICATION NO. : AS:293:80:MAY:2013

1.0 SCOPE:

1.1 This standard prescribes requirements and methods of testing for Tyre Curing Bladder.

1.2 This is a purchase specification and does not include manufacturing details. The parts/material supplied against this specification shall be compatible with the original equipment.

1.3 The supplier shall provide detail drawings and specifications to the purchasing/ inspecting authority whenever such information is specifically called for.

1.4 The material offered against this specification shall conform to this specification in full. The tests shall be carried out on the part directly or on the specimen prepared from the components'. If any of the samples fail in any one or more tests specified in Table 1, the sample shall be considered as not having met the requirements of this specification.

1.5 It is the manufacturer's prime responsibility to satisfy the inspection authority that the commodity conforms to this standard. This may be accomplished by performing the tests specified in this standard.

1.6 Sample selection shall be the responsibility of the Quality Assurance Officer. Required quantity for complete testing as per this specification shall be supplied.

1.7 This specification supersedes earlier specification No.AS:293:61:OCT:2000

2.0 APPLICATION AND REFERENCE:

2.1 This specification covers the requirements of Tyre Curing Bladder used for Pre-cured Retreading Process of Pneumatic Tyres having nominal size of 9.00 x 20 ,10.00 x 20 , 7.50x16, 8.25x16 used on automobiles.

2.2 The following Indian Standards are necessary adjuncts to this standard.

Sr. No.	Specification No.	Year	Title
1.	IS:3400 (Part 1)	1987	Methods of test for vulcanised rubber. Tensile stress/strain properties (Second revision)
2.	IS:3400 (Part 2)	1980	Hardness (First revision) Reaffirmed 1991
3.	IS:3400 (Part 4)	1987	Accelerated ageing (Second revision)
4.	IS:3400 (Part 22)	1984	Method of tests for vulcanized rubber Chemical Analysis. Reaffirmed 1990
5.	IS:9081	1992	Automotive Vehicles – Valves & Valve Accessories for Pneumatic Tyres – Specification.
6.	IS:10939	1984	Designation of Valves for Pneumatic Tyres

3.0 TESTS & REQUIREMENTS:

3.1 Test Quantity :

Minimum one sample shall be supplied for testing.

3.2 Workmanship shall be of the quality that the Tyre Curing Bladder is free from any defect which affect the appearance or impair its serviceability such as separation of bond or adhesion around the valve stem, air pockets, or visible lack of adhesion in butt or lap splices, incorrect or damaged valves, and air bubbles, cracks or other faults in its outer surface when installed in the tyre, which in turn, is used for its intended purpose. Inflated bladder shall not show any air leakage when tested as detailed below in 3.4.

3.3 The Tyre Curing Bladder shall have uniform thickness and be symmetrical in shape and designed to fit properly in tyres having nominal size of 9.00 x 20 ,10.00 x 20 , 7.50x16, 8.25x16.

3.4 The Tyre Curing Bladder with valve shall be inflated to just round out giving circumferential length of 300 Cms for 9.00 x 20 ,10.00 x 20 & 240 cms for 7.50x16, 8.25x16. approximately and tested under water for evidence of any leakage on the bladder surface, joints and through valve.

The Tyre Curing Bladder shall not show any leakage or defective workmanship which may impair air tightness. Failing to meet this requirement the bladder shall be considered for rejection.

3.5 Bulging:

When Tyre Curing Bladder is inflated to just round out i.e. 305 Cm for 9.00x 20 / 10.00x 20 and 245cm 7.50x 16/ 8.25x 16 approx. circumference, the cross-sectional diameter shall be measured at four places at 90^0 intervals away from joints. The variation in cross sectional diameter shall not be more than 10%.

3.6 Minimum Permissible Thickness:

The thickness of the bladder at any point shall not be less than 3mm of the average gauge of the 16 readings taken on the test specimen. Measure the thickness of the specimen using dial thickness gauge. The thickness of each test specimen shall be gauged at each of four points, i.e. crown centre, base centre, right side wall centre and left side wall centre.

3.7 Outside Cross-Sectional Periphery:

Outside Cross-sectional Periphery (Girth) of the curing bladder may be 49 to 54 cms. When measured as detailed below:

3.7.1 To determine conformity to above, avoiding splice and vent areas, four specimens each 2.5 cm wide, shall be cut squarely across the bladder. The first shall be cut some distance away from the valve and the other three shall be cut at 90 degree intervals therefrom. Each of the four 2.5 cm wide rings shall be laid on flat surface in the original moulded shape of the bladder cross section and measured with a flat steel tape, around the outside of the section. The average of four measurements shall be taken as the outside cross sectional periphery **OR**

Each of the four specimen obtained shall be cut squarely across the width away from the centre of the base or centre of the crown. They shall be laid on a flat surface, with what was part of the outside OD the inner tube uppermost. These four surfaces shall be measured for length and their average taken as the cross-sectional periphery.

3.8 Valve:
Tyre Curing Bladder shall be equipped with suitable valve conforming to IS:9081.

3.9 Material:
Tyre Curing Bladder in sizes shall be made from an appropriate rubber composition having excellent heat air ageing properties in air, steam water, hot flex properties and resistance to growth in service. The finished product shall be usable for 80 curings min.
The rubber hydrocarbon content shall not be less than 55% weight by weight.

3.10 Testing:
The methods of testing shall be those specified in Table 1 against each requirement.

4.0 MARKINGS:

4.1 Each Curing Bladder shall be permanently marked with the manufacturer's name, trade mark and size.

5.0 PACKING:

Material shall be suitably packed to avoid damage during transit/handling.

TABLE 1

Sr. No.	Characteristics	Requirements	Method of Test IS:3400
1.	Visual Examination	Shall be permanently engraved as detailed in Cl. 4.1	-
2.	Air Tightness	No air leakage shall be observed from the tube or valve (Clause 3.4).	-
3.	Buldging	The variation in cross sectional diameter shall not be more than 10%.	-
4	Thickness, mm, Min.	3.0	-
5	Ash Content, Max.	4.0	Pt 22
6	Rubber Hydrocarbon Content, %, W/W, Min.	55.0	-
7	Specific Gravity	1.10 to 1.14	
8	Hardness, Shore A (Max.)	60	Pt 2
9	Pull out strength of rubber base for valve breaking load Kgf. Min.	175	IS:9081-1985 Cl. 5.4
10	Tensile Strength, Kgf/Cm^2, Min.	100	Pt 1
11	Elongation at break, %, Min.	525	Pt 1
12	Strength of Splice, Kg/Cm^2, Min.	80	Pt 1
13	Change in physical properties after accelerated ageing at 170 $\pm$ 2^0C for 24 hours		Pt 4
(a)	Tensile Strength, %, Max.	-80	Pt 1
(b)	Elongation at break, %, Max.	-50	Pt 1
14	Tension Set, (50% elongation at 170 $\pm$ 3^0C for 8 hrs.), % Max.	80	Pt 17 Cl. 6.3

WEIGHTAGE MARKS FOR TYRE CURING BLADDER
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Sr. No.	Properties	Clause	Marks Allotted	P/T
1.	Visual Examination (Identification Markings)	3.2 and 4.1	3	T
2.	Air Tightness	3.4	2	T
3.	Bulging	3.5	5	P
4.	Thickness	3.6	2	T
5.	Hydrocarbon Content	3.9	9	P
6.	Ash Content	3.10 (4)	3	P
7.	Specific Gravity	3.10 (5)	2	P
8.	Hardness	3.10 (6)	2	P
9.	Pull out strength of rubber base for valve	3.10 (7)	2	P
10.	Tensile Strength	3.10 (8)	15	P
11.	Elongation	3.10 (9)	10	P
12.	Strength of splice	3.10 (10)	10	P
13. a) b)	Accelerated ageing Change in Tensile Strength Change in Elongation at Break	3.10 (11) 3.10 (11a) 3.10 (11b)	 15 15	 P P
14.	Tension Set (Permanent Set)	3.10 (12)	5 ------ 100 ------	P

P = Proportionate marks shall be considered

T = Total marks shall be considered